The Role of Technology Policies for CCS in Climate Mitigation

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May, 2010

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Introduction

- Stabilizing global GHG concentrations will require massive decarbonization over the next few decades.
- A multi-faceted policy effort will be needed to support a broad array of technological and behavioral changes.
- This presentation outlines some core principles for guiding the design of clean technology policies, with a focus on CCS.

Core Principles for Technology Policy

1. Pick winning technology policies – not technology winners
2. Carbon price is a technology policy
3. Address barriers
   - Some may require technology-specific policies
4. Extra benefits merit extra support
   - Option values, international spillovers

Carbon price is a technology policy.

- Most important technology-neutral policy and the core of any cost-effective approach
  - Economy-wide carbon tax or broad-based cap-and-trade
- Creates "market pull" for any emissions-reducing technology
- CCS not financially viable without it
  - Absent subsidies or mandates

A Carbon price alone is not enough.

- Additional policies needed to address other market failures and barriers
  - Compensate for technology "spillovers"
  - Remove distorting subsidies and regulatory barriers
  - Address behavioral failures with information and standards
  - Reduce financial risks
  - Support scale economies, networks and infrastructure
- Many apply to CCS

Compensating for Technology "Spillovers"

- Patents help private actors reap benefits from their innovations, but social value often higher yet
- Spillovers not exclusive to climate R&D, much less CCS

Removing Barriers and Distortions

- Remove inefficient regulations
  - Create regulatory certainty for CCS, including liability
  - Streamline licensing and coordinate across jurisdictions, while allowing for appropriate oversight
- Price other environmental damages

Reducing Uncertainty

- Private perceptions of risk and payback horizons may not align with the public ones
- Technologies for which capital costs are very large are more likely to need preferential financing or guarantees
  - CCS, also nuclear, hydro
- Technology demonstrations can resolve some uncertainties and raise confidence
- Greater certainty about the carbon pricing policy will help reduce risks and raise returns for low-carbon technologies,

Scale Economies

- Until enough units have penetrated the market, production costs are high and support services are scarce.
  - Avoid extended support for uneconomic technologies with policies that phase out.
- Infrastructure may be needed
  - Pipelines
- Private actors prefer to wait for someone else to do it.

Some Rationales for CCS Focus

- Comparative advantage
- Option values
  - Availability of "backstop" technologies means that if stricter-than-expected emissions targets are necessary, carbon prices will not need to rise astronomically.
- International spillovers
  - Advances that support international efforts and agreements have additional value beyond what is appropriated at home.

Caveats for Technology Policies

- Not all barriers to adoption are market failures
  - Cost, reliability and quality issues, risk, etc., are all legitimate
- Broad-based incentives for carbon reductions and R&D can reduce need to rely on expensive CCS
- Public revenues have opportunity costs
- Main tools for encouraging climate-friendly technologies should be those that encourage the market to make good choices more generally

Thanks!

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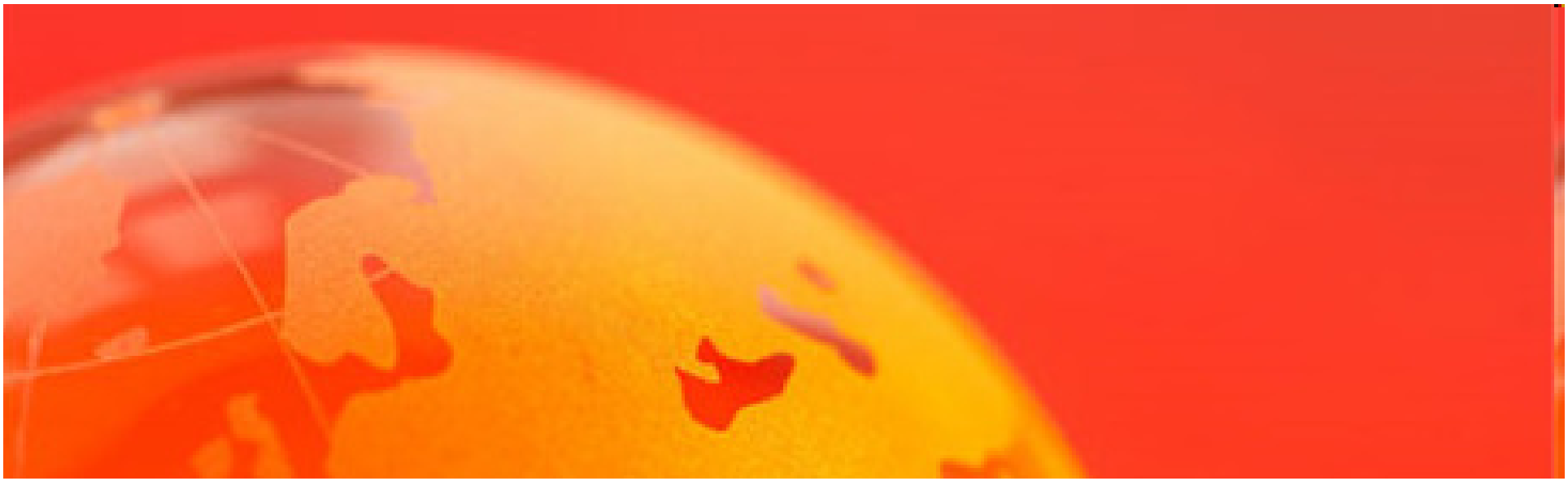

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Policy Options

- Policies are more effective, the more closely they target specific market failures, as opposed to specific technologies.
  - Flexible rather than prescriptive
- Broad-based R&D policies: tax credits, funding universities and research institutions, competitive grant-making.
- Scale economies can be supported through tax breaks, subsidies, performance standards, or market-share mandates.
  - Latter are self-financing and naturally phase out
- Targeted options: specific tax credits, grants or contracts, or directed research in publicly funded laboratories, joint demonstration projects, technology prizes

International Engagement

- RD&D policies may be national, but the development of new technologies is a global effort.
- Opportunities for coordination (or free-riding) and for specialization.
- Technology oriented agreements (TOAs) can increase the effectiveness of an agreement over emissions reductions
  - But generally weak policies on their own.
  - Knowledge sharing and coordination, research, development or demonstration, and even deployment.
- TOAs can also help ensure trading partners have similar cost burdens.
  - Standards